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ABSTRACT

This paper provides a brief review of major research findings on how the kind and level of courses students take in high school affect their performance on tests, their readiness for college-level work, and their persistence in earning a degree. It also features a look at what constitutes a "rigorous" high school curriculum. Highlights from four recent studies show the importance of a rigorous high school curriculum for student academic success. Opinions vary about what constitutes a strong academic curriculum, but the National Center for Education Statistics has suggested that a rigorous curriculum should consisted of 4 years of English, 3 years of a foreign language, 3 years of social studies, 4 years of mathematics, 3 years of science, and at least 1 advanced placement course. Only about half of U.S. students graduate having completed even a "mid-level" curriculum as defined by the National Commission on Excellence in Education's recommendations. There are increasing calls today for eliminating differentiated curricular tracks and sorting practices and for giving all students the opportunity to take college-preparatory courses. Research has demonstrated that college-preparatory courses make a large difference in later academic success. (SLD)

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EDUCATION COMMISSION OF THE STATES

ECS

The Progress of Education Reform 1999-2001

High School Curriculum

Vol. 3, No. 1, August-September 2001

What's inside

- Research backs challenging curriculum
- What does a good curriculum look like?
- Does it make a difference?

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Challenging Courses Lay Groundwork for Success in College and the Workplace

Today, nearly three-quarters of the nation's high school students go on to postsecondary education within two years of graduation. But a troublingly large number of these students stumble at the starting line, requiring remediation in math, English and other basics before being allowed to enroll in college-level courses. And more than one-quarter of the freshmen at four-year colleges – and nearly half of those at two-year colleges – do not even make it to their sophomore year.

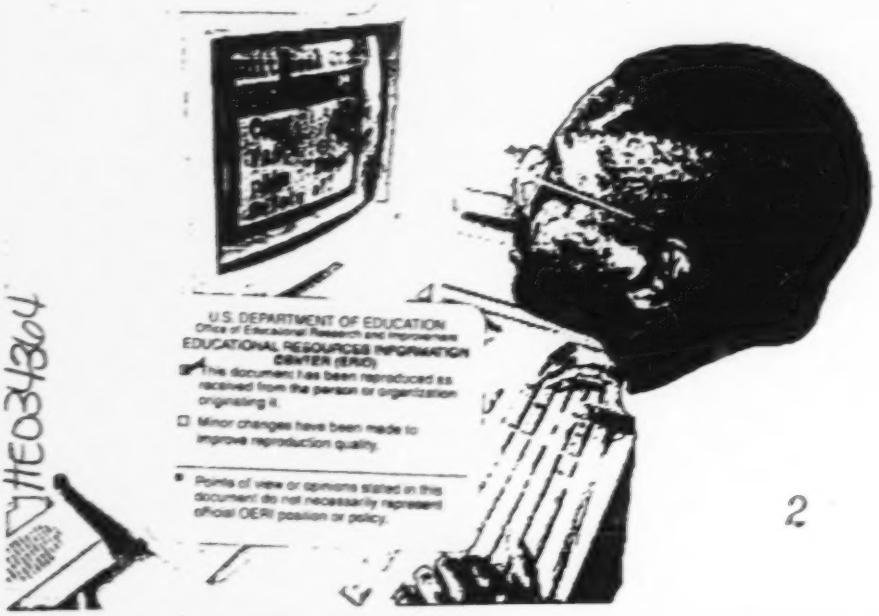
Consider this statistic: Despite huge increases in the college-going rate over the past three decades, the percentage of students who stay on track to earn a four-year baccalaureate degree is roughly the same as it was in 1950.

A growing body of evidence suggests that a major contributor to this problem is the quality and intensity of the high school curriculum. Too few students are taking the kind of courses they need to enter college ready to succeed.

A strong curriculum is important for work-bound students, too. Regardless of whether new high school graduates aspire to careers requiring university degrees or technical certificates, the prerequisites are virtually the same – algebra, geometry, laboratory sciences and strong communication and problem-solving skills.

"High schools can no longer act as sorting machines, preparing some students for postsecondary education and some for the world of work," the National Commission on the High School Senior Year concluded in its January 2001 report, *The Lost Opportunity of Senior Year: Finding a Better Way*. "The conditions of modern life demand that all students graduate from a rigorous academic program that equips them with the knowledge and skills needed to succeed in *both* postsecondary education and careers."

This issue of *The Progress of Education Reform 1999-2001* provides a brief review of major research findings on how the kind and level of courses students take in high school affect their performance on tests, their readiness for college-level work and their persistence toward a degree. It also features a look at what constitutes a "rigorous" high school curriculum.



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Research Shows Positive Effects of a Challenging Curriculum

Here are highlights from several recent studies of the link between high school course-taking and student achievement on tests, college-going rates and degree attainment.

Answers in the Tool Box: Academic Intensity, Attendance Patterns and Bachelor's Degree Attainment

(U.S. Department of Education, Office of Educational Research and Improvement (OERI), June 1999, http://www.ed.gov/pubs/Toolbox/index.html)

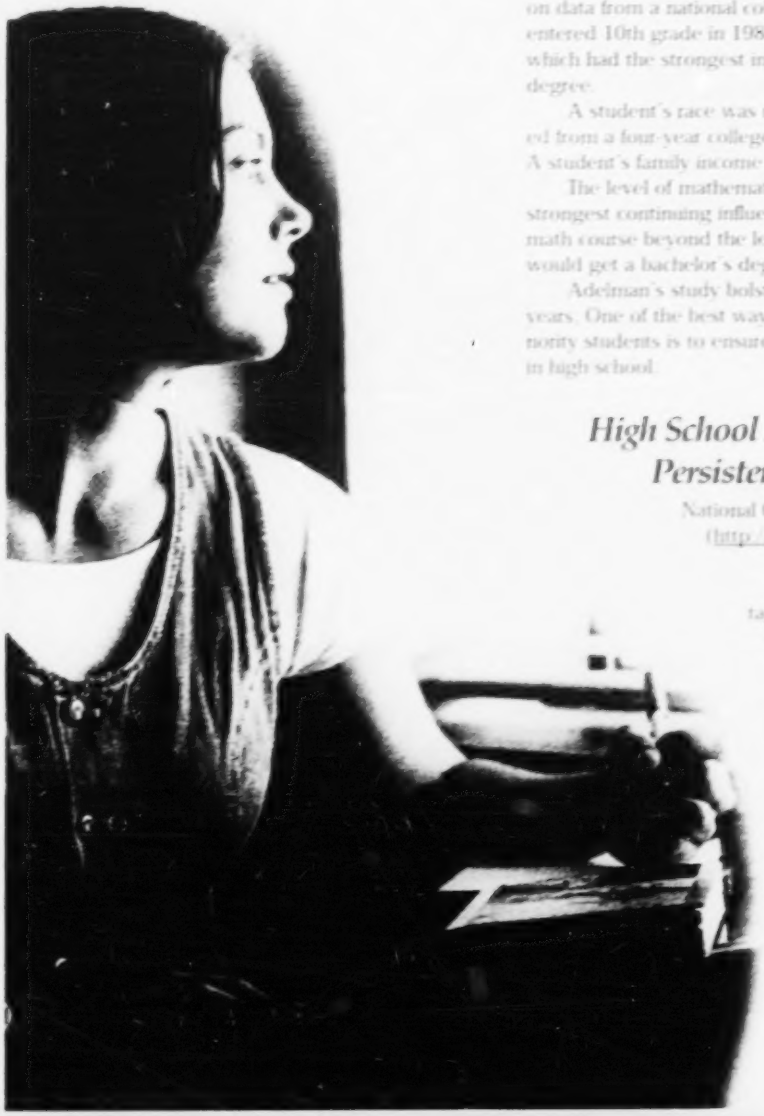
According to this study, the biggest factor in determining whether young people earn a bachelor's degree is participation in a strong academic curriculum in high school. The completion of a solid academic core was more strongly correlated with a bachelor's degree than high school test scores, gradepoint averages or class rank, the study found. Moreover, an intensive academic curriculum in high school had the strongest positive effect for black and Hispanic students.

The study, conducted by Clifford Adelman, OERI senior research analyst, was based on data from a national cohort of students who were followed from the time they entered 10th grade in 1980 until roughly 1993. The study looked at 24 variables to see which had the strongest influence on whether young people earned a bachelor's degree.

A student's race was not a significant predictor of whether a young person graduated from a four-year college, once other factors were taken into account, the study found. A student's family income also had little effect after the first year of college.

The level of mathematics that students studied in high school appeared to have the strongest continuing influence on whether they earned a bachelor's degree. Finishing a math course beyond the level of Algebra II more than doubled the odds that a student would get a bachelor's degree, according to the study.

Adelman's study bolsters what many school reform advocates have been saying for years. One of the best ways to close the attainment gap between minority and nonminority students is to ensure that all young people complete a solid academic curriculum in high school.



High School Academic Curriculum and the Persistence Path Through College

National Center for Education Statistics, August 2001, (http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2001163)

The findings of this study demonstrated a consistent advantage for students who completed rigorous high school curricula – and to a lesser extent for those completing mid-level curricula – over their peers enrolled in lower-level courses. Students who completed rigorous curricula were more likely to stay enrolled in their first institution or, if they transferred, to stay on track to a bachelor's degree.

Students from low-income families, those who parents attained no higher than a high school education and those who attended high schools in which a large proportion of the students were eligible for free or reduced-price lunches all were less likely to have completed a rigorous high school academic curriculum than their more advantaged counterparts.

For both measures of persistence – staying continuously enrolled in the same institution and staying on track to a bachelor's degree if they transferred – students who completed a rigorous high school curriculum did better than

those who completed no higher than basic curricula. This finding held even when controlling for socioeconomic background, college admission exam scores, the type of college that students first attended, how well students did in their first year of college and other variables known to be associated with college persistence and degree attainment.

The results of this study suggest that completing a rigorous academic curriculum in high school may help students overcome socioeconomic disadvantages such as low family income and parents with no college experience, as well as helping students who, for whatever reasons, transfer to another institution.

Youth at the Crossroads: Facing High School and Beyond

(The Education Trust, January 2001.
www.commissiononthesenioryear.org/HSReportfinal.pdf

Prepared for the National Commission on the High School Senior Year, this report provides a detailed look at various aspects of high school education in America, including achievement trends, curriculum design, dropout rates, demographic factors and school size.

According to the report, more and more high school students are completing the academic sequence recommended in the mid-1980s by the National Commission on Excellence in Education, and fewer and fewer students are taking "general" or "vocational" courses. From 1982 to 1994, the percentage of students taking the course sequence recommended by the commission more than tripled, from 14% to a little over 50%.

But this progress has not been nearly as fast as the increases in the numbers of students going to college. While almost three-quarters of high school graduates go on to postsecondary education, fewer than half have completed a full college-preparatory program, the study found.

And even when high schools eliminate formal tracking and give all students an opportunity to take college-prep courses, many students don't. One reason, according to the study: Overworked guidance counselors typically don't have the time to help all students choose their courses wisely. The ratio of students to guidance counselors in the nation's schools, the study noted, is about 500-to-1.

Much of the report focuses on the lack of alignment between the high school curriculum and the kind of knowledge and skills required for success in both the workplace and the postsecondary system.

The report noted, for instance, that the graduation exams many states administer to high school students are not aligned with the tests used for college admissions or for placement into college-level courses. In many cases, the high school tests address content that does not exceed the 9th- or 10th-grade level. According to data provided by the National Association of System Heads, in only 10 states are high school graduation English requirements and college admission requirements aligned. And the number is even lower – only two states – in math.

The gulf between K-12 goals and the skills needed to begin college-level work is reflected in the fact that more than one-quarter of the students who enter college are required to take remedial courses in one or more subjects. Remediation takes place in all community colleges, in four out of five public four-year institutions and in more than six out of 10 private four-year institutions. Students who require remediation range from a low of 13% at private four-year colleges to a high of 41% at public two-year institutions.

Paving the Way to Postsecondary Education: K-12 Intervention Programs for Underrepresented Youth

(March 2001. National Center for Education Statistics (NCES), prepared for the Council of the National Postsecondary Education Cooperative/Patricia Gandara and Deborah Bial. To order, call toll free 1-877-433-7827, or write U.S. Department of Education, ED Pubs, PO Box 1398, Jessup, MD 20794-1398)

Since the mid-1970s, college-going rates for white students have increased significantly. In contrast, despite progress in the 1990s, students from historically underrepresented minority groups have not experienced substantial increases in college-going rates. College going among white students increased 12% between 1976 and 1997, but only 6% for blacks and less than 1% for Hispanics during the same period.

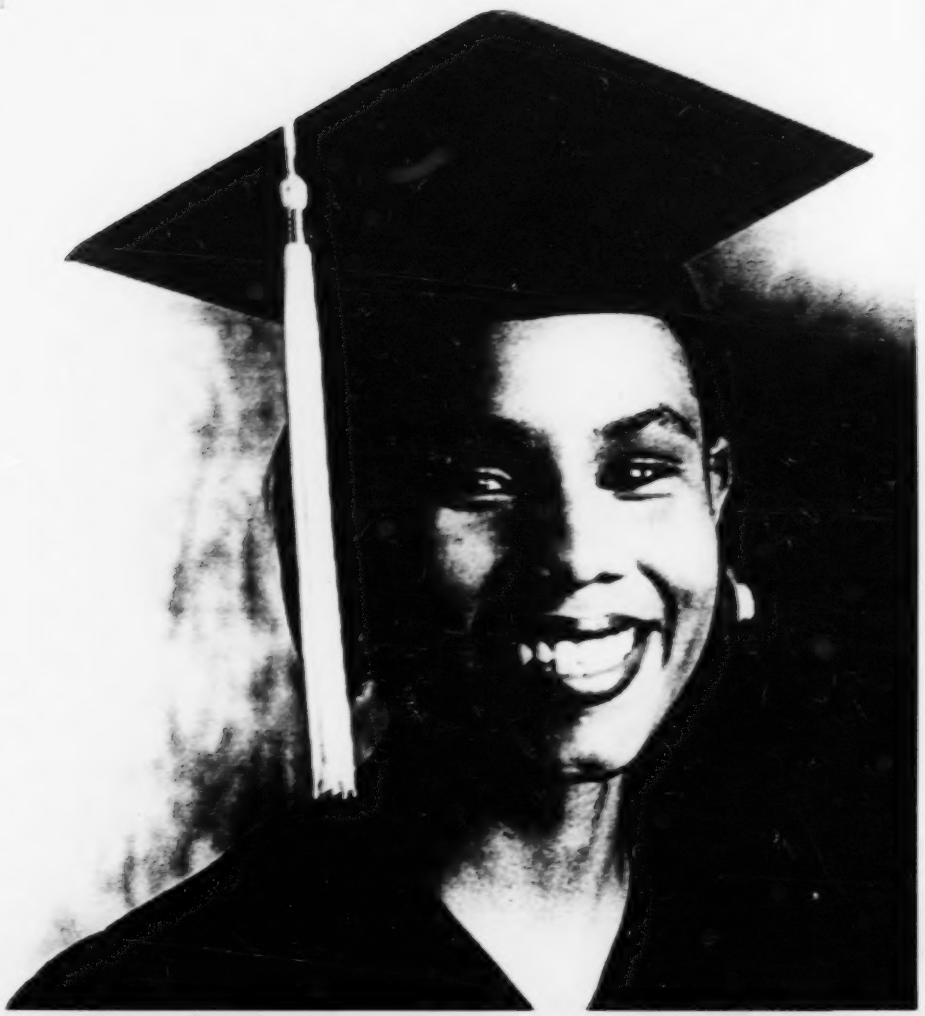
This study examined intervention and outreach programs that appeared capable of increasing the college-going rate of minority students. One of the common elements of such programs, the study found, was the provision of high-quality instruction through access to the most challenging courses offered by the school (untracking), special coursework that supports and augments the regular curricular offerings (tutoring and specially designed classes), or revamping the curriculum to better address students' learning needs.

The report noted that it is critically important to know what factors in the high school and pre-high school years lead to the probability of a student taking rigorous coursework in high school.

Resources

The Lost Opportunity of Senior Year: Finding a Better Way. Summary of Findings, January 2001. National Commission on the High School Senior Year http://www.commissiononthesenioryear.org/Report/CommissionSummary2.pdf

"High School: The Shifting Mission", April 11, 2001. *Education Week* http://www.edweek.org/ew/ewstory.cfm?slug=30highschool.h20&keywords=academic%20courses%20in%20high%20school



What Should the High School Curriculum Look Like?

Opinions vary as to what constitutes a strong academic curriculum.

The National Commission on Excellence in Education, in a follow-up to its landmark 1983 report, *A Nation at Risk*, recommended that all high school students be required to complete four years of English, three years each of math, science and social studies, and one to one-and-one-half years of computer science. In addition, those students planning to attend college should take two years of a foreign language, the commission said.

Similarly, the U.S. Department of Education's 1999 report, *Answers in the Toolbox*, defined a "rigorous" curriculum as more than three years each of English and math (including math beyond Algebra II), a minimum of two years each of laboratory sciences, history and foreign languages, and more than one Advanced Placement (AP) course.

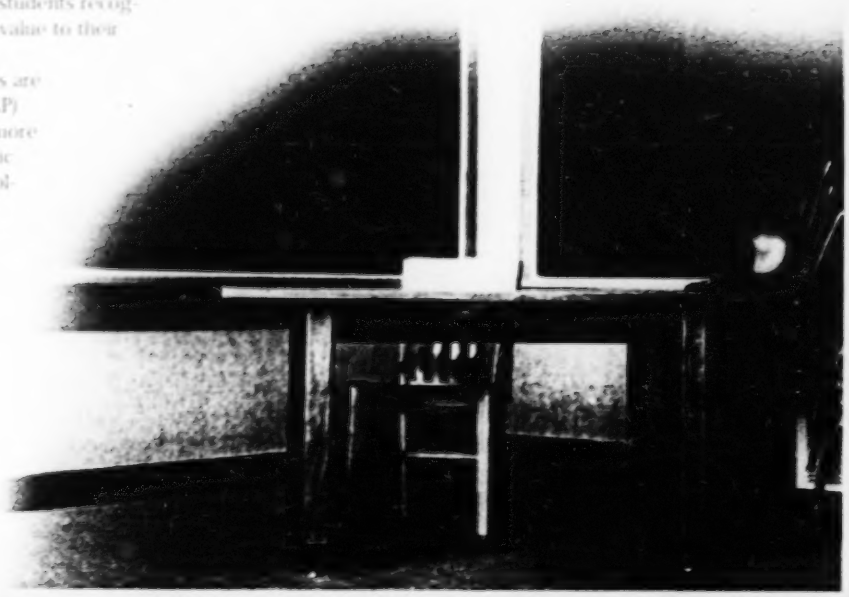
More recently, the National Center for Education Statistics set the bar even higher. Its August 2001 report, *High School Academic Curriculum and the Persistence Path Through College*, describes a rigorous curriculum as four years of English, three years of a foreign language, three years of social studies, four years of math (including pre-calculus or higher), three years of science and at least one AP course.

According to a recent report by The Education Trust, only about half of the nation's high school students graduate having completed even a "mid-level" curriculum along the lines of the commission's recommendations. And just 12% complete the kind of rigorous program described in the NCES study. The statistics are even more dismal for poor and minority students, who are considerably less likely than nonminority students to be enrolled in or even have access to – rigorous courses.

The K-12 standards movement has given rise to widespread rethinking of the traditional, three-track high school curriculum – vocational, general and college preparatory. Research suggests that grouping students in this manner restricts access to lower-level classes to challenging content and the best teachers, hampering students' ability to reach high academic standards.

Today, there are increasing calls for eliminating differentiated curricular tracks and sorting practices, and for giving all students an opportunity to take college-prep courses. The National Commission on the High School Senior Year, for example, recently recommended merging the best elements of the academic and vocational tracks into one core curriculum that students recognize as having relevance and practical value to their lives.

A growing number of high schools are looking to the Advanced Placement (AP) program as a quick way to introduce more rigorous coursework into their academic programs. High school teachers and college instructors work together, in various subject areas, to develop the AP tests, which enable students to earn college credits for taking tougher classes in high school. Former U.S. Secretary of Education Richard W. Riley last year called for every American high school to offer at least one AP course by fall 2001 and to add one such course each year for the next 10 years.



How Much Difference Does a Strong Academic Program Make?

- High school students in the "general" track scored 24 points lower on the reading portion of the National Assessment of Educational Progress (NAEP) than students in the academic track. Students in the vocational track scored 38 points lower than students in the academic track. (National Center for Education Statistics, *NAEP Trends in Academic Progress*, 1998, Table 105)

- In math, students who complete the full college-preparatory sequence (pre-algebra through pre-calculus or calculus) perform much higher on NAEP tests than those who complete only one or two courses. The same pattern is true in NAEP science and on the SAT. (National Center for Education Statistics, *NAEP Trends in Academic Progress*, 1999, page 113)

- Finishing a math course beyond Algebra II more than doubles the odds that a student will get a bachelor's degree. (U.S. Department of Education, *Answers in the Toolbox: Academic Intensity, Attendance Patterns and Bachelor's Degree Attainment*, 1999)

- Higher expectations push more students – especially minority students – to achieve at a higher level. When the El Paso Independent School District began requiring that all high school students enroll in Algebra 1, 55% of all Hispanic students passed the course, up from 31% before the requirement was put in place. (National Commission on the High School Senior Year, *The Future of High School Reform*, 2001)

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